

## PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 19 APR 2006



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Applicant's or agent's file reference P03EC065PCT	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. <b>PCT/KR2004/000707</b>	International filing date(day/month/year) <b>27 MARCH 2004 (27.03.2004)</b>	Priority date (day/month/year) 20 NOVEMBER 2003 (20.11.2003)	
International Patent Classification (IPC) or national classification and IPC  <b>H04N 7/015(2006.01)i</b>			
Applicant <b>ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE et al</b>			

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 3 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
  - ☐ (sent to the applicant and to the International Bureau) a total of \_\_\_\_\_ sheets, as follows:
    - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_ containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).

- This report contains indications relating to the following items:
  - ☒ Box No. I Basis of the report
  - ☐ Box No. II Priority
  - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - ☐ Box No. IV Lack of unity of invention
  - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - ☐ Box No. VI Certain documents cited
  - ☐ Box No. VII Certain defects in the international application
  - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand  <b>22 APRIL 2005 (22.04.2005)</b>	Date of completion of this report  09 MARCH 2006 (09.03.2006)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer  PARK, Jin Woo  Telephone No. 82-42-481-5765 

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/000707

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☒ This report is based on translations from the original language into the following language English which is the language of a translation furnished for the purposes of:
    - ☐ international search (under Rules 12.3 and 23.1(b))
    - ☒ publication of the international application (under Rule 12.4)
    - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
  - ☒ the international application as originally filed/furnished
  - ☐ the description:
    - pages \_\_\_\_\_ as originally filed/furnished
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - ☐ the claims:
    - pages \_\_\_\_\_ as originally filed/furnished
    - pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - ☐ the drawings:
    - pages \_\_\_\_\_ as originally filed/furnished
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - ☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, Nos. \_\_\_\_\_
  - ☐ the drawings, sheets \_\_\_\_\_
  - ☐ the sequence listing (*specify*): \_\_\_\_\_
  - ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, Nos. \_\_\_\_\_
  - ☐ the drawings, sheets \_\_\_\_\_
  - ☐ the sequence listing (*specify*): \_\_\_\_\_
  - ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/000707

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

## 1. Statement

Novelty (N)	Claims	1-10	YES
	Claims		NO
Inventive step (IS)	Claims	1-10	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-10	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

D1 : KR 2002-0096988 A

D2 : EP 1058406 A2

D3 : WO 96-02100 A1

### 1. NOVELTY(N)

The present invention relates to a decision feedback equalization apparatus and method as in a ground wave digital broadcasting receiving system. It is considered to involve an inventive step according to characteristics as follows, despite the prior arts(D1-D3).

That is, in a digital broadcasting receiving system, a specific channel of a poor receiving signal is changed to be mild by using a channel-matched filter, and a decision error can be reduced at the input process of a symbol detector by using a trellis decoder in which TBD(Trace Back Depth) is 1 and the complexity is decreased.

More specific characteristics can be referred to in the components of Claim 1.

### 2. INVENTIVE STEP(IS)

The present invention's solution of its target problems is that a specific channel of a poor receiving signal is changed to be mild by using a channel-matched filter, and a decision error can be reduced at the input process of a symbol detector by using a trellis decoder in which TBD(Trace Back Depth) is 1 and the complexity is decreased as shown in claims.

D1 relates to reducing complexity and errors of hardware by providing an adaptive equalizer, including a decision feedback equalizer having a trellis decoder, a mapper which is connected to the output of the trellis decoder and taps connected to an output of the trellis mapper.

D2 relates to a method and apparatus for reducing the computational complexity and relaxing the critical path of reduced state of sequence estimation techniques.

D3 relates to a digital sender/receiver system for reducing the complexity of a receiver by means of a TCM technique and a comb filter, which is a receiver for reducing the interruption of a co-channel and improving the S/N function.

The above inventions have in common in that receiving sensitivity is increased and the complexity of hardware is reduced. However, they do not meet all of the characteristics of the present invention.

### 3. INDUSTRIAL APPLICABILITY(IA)

The invention claimed in Claims 1-10 is considered to be industrially applicable.